in the grate, and to keep the air-channels at all times open.

The principle of the invention consists in moving the alternate bars longitudinally in contrary directions, which is effected by a system of levers, moved either by hand or by a connexion with a steam-engine. For a 30-horse boiler, ½-horse power is required to effect the regular and continuous movement of the bars.

Mr. Chanter afterwards explained, by means of large sectional drawings, the application of his smoke-consuming apparatus, which is applied in a variety of forms to different kinds of boilers. Instead of cold air, Mr. Chanter introduces jets of warm air behind the bridge of the furnace.

The result of a series of experiments with Mr. Chanter's apparatus, made in July 1843, at the great cloth-works of Messrs. Thompson, brothers, at Clitheroe, Lancashire, shews a saving of fuel of 16 per cent for steam-boilers, 30 per cent on singeing-plates, and nearly 38 per cent in blanket-drying stoves.

No. VI.

ON LOCKS.

December 6th, 1843.

W. TOOKE, ESQ. V.P. IN THE CHAIR.

Mr. Solly and Mr. Varley explained by means of models a variety of ingenious and useful locks, most of which have been rewarded by the Society, including the Arab lock of wood, supposed to have been found in one of the pyramids of Egypt, and which lock is now in the Society's possession; the alarm-lock of Mr. Meigham;

Mr. Mackinnon's permutation lock; and an excellent street-door lock, as fixed on the front door of the Society's premises.

No. VII.

A PLAN OF FORMING A FIXED BREAKWATER.

By J. Johnston, Esq.

Dec. 13, 1843.

BENJAMIN BOND CABBELL, ESQ. F.R.S. V.P. IN THE CHAIR.

Abstract.

The plan is as follows. A series of distinct and separate caissons, each representing in external form one half of the pier of a bridge, with its cutwater presented to the sea, is to be formed in five to six-fathom water, according to any particular locality. Each caisson is to consist of cast-iron plates of large size, coated with coal-tar in order to prevent corrosion, and bolted together by means of four-inch flanges; the whole to be filled with concrete, granite, or other suitable material: the lower part of each caisson, to the height of thirty-two feet, having a foundation platform of wood, to be completed on shore, and, when prepared, to be launched and towed out to its destined position (as were the caissons of Westminster and Blackfriars' bridges), and then lowered into their final position: the whole to be secured to the bed of the sea by means of cast-iron piles, driven through tubes of the same material. As the upper part of the caisson is put together, so is the interior to be filled up with the solid materials: a coping of well-cramped masonry is to be fixed all round each caisson. The weight of each caisson complete would be about 4500 tons, and the cost of a break-